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FOOD REPORTS

JUNEAU ICE FIELD RESEARCH PROJECT, ALASKA

June 1949 to February 1951

By

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Juneau Ice Field Research Project

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FOOD REPORTS
OF THE
JUNEAU ICE FIELD RESEARCH PROJECT, ALASKA

June 1949 to February 1951

Contents:

1949 Summer Expedition, by M.G. Marcus and others
1950 Summer Expedition, by F.A. Small and others
1951 Winter Expedition, by M.M. Miller and T.R. Haley, M.D.

June 1951
Department of Exploration and Field Research
American Geographical Society
Broadway and 156th Street
New York 32, New York.

FOREWORD

The Juneau Ice Field Research Project was initiated in 1948 by the American Geographical Society and has been continued with summer field parties in 1949 and 1950 and a winter operation for one month in January and February 1951. The main purpose of the project is to conduct a comprehensive and detailed study of the physical character and regimen of the glacier system comprising what is known unofficially as the Juneau Ice Field, situated in the Coast Range of Southeastern Alaska, north and northeast of Juneau.

Since 1949 the work has been performed under contract with the Office of Naval Research (Task Order N9-onr-83001). Through the Research and Development Board extensive logistical support has been provided by the Departments of the Army and the Air Force. Valuable assistance has been obtained from the Quartermaster Corps, Signal Corps, Corps of Engineers, Ordnance Corps, Medical Corps, Air Materiel Command (through Bailment Agreement AF 33(038)-6114), and Air Weather Service, U.S.A.F. Additional help has been received from the U.S. Forest Service, U.S. Geological Survey, U.S. Weather Bureau, Arctic Institute of North America, Geological Society of America, Blue Hills and Mount Washington observatories, Stanford Research Institute, E.J. Longyear Company, Eastman Oil Well Survey Company, and other agencies.

The scene of field operations of this project centers at the small research station which was built in 1949 on a rock island (nunatak) at an elevation of 3,875 feet. This station overlooks the upper Taku Glacier, sixteen miles from its terminus. Subsidiary camps have also been established at various points on the ice field.

The number of days spent in the field by the various parties are as follows: 1948 reconnaissance, 20 days; 1949, 100 days; 1950, 110 days; 1951 winter, 32 days. The number of personnel taking part in the field work has varied from a minimum of six men on the 1948 reconnaissance to a total of 31 men during the summer of 1950.

The research program has embraced meteorological observations, glaciological investigations of the firn and underlying ice and of glacier regimen, studies of directional movement and rates of flow of the glaciers, studies of glacier variations and climatic change by means of plant ecological techniques and geomorphological observations, surveying of the environmental terrain, and geological investigations.

These reports from the 1949 and 1950 field seasons and the 1951 winter expedition, have been prepared primarily for the reference and use of future expeditions into polar and alpine regions. The lessons learned, recommendations made, and the types of food lists included, should serve as practical aids to both the planning and operational phases of such field enterprises whether large or small. It is further hoped that these notes may provide a useful factor for the maintenance of proper morale of the field party concerned, as well as increased efficiency in the field operations involved.

JUNEAU ICE FIELD RESEARCH PROJECT, ALASKA

1949

FOOD REPORT

Prepared by Melvin G. Marcus, chairman of the Expedition's Food Committee, and with the help and cooperation of other members of the party.

CONTENTS

I. Requirements and Procedures.
II. Food Analysis.
Appendix 1. Source and Purchase List.
Appendix 2. Ice Field Food and Quantity Distribution Lists.

Department of Exploration and Field Research
American Geographical Society
New York, New York.

JUNEAU ICE FIELD RESEARCH PROJECT

1949 - FOOD REPORT

I. Requirements and Procedures:

The determination of the quantity and variety of the food to be supplied for the Juneau Ice Field Research Project in 1949 was considerably more complicated than the planning and purchasing of supplies in 1948.* The related logistics problem encountered during the second field season was similarly more complex. In 1948 quantities could be quite accurately calculated because of the small field party (6), the limited time anticipated in the field, and the use of only three aerially supplied camps. In 1949 the procurement and delivery of food and supplies had to be planned for an expedition which was to spend 105 days in the field, with more than three times as many members to feed than the year before.** Miscellaneous supporting aircraft had to fly supplies to nine different base camps located over nearly 500 square miles on and around the ice field. Other factors contributing to the problem were the unusually stormy summer weather conditions experienced, the new and experimental nature of much of the field work, the fluctuations in the size of the party, and the movements of personnel from one camp to another. As the number of men who might be occupying a particular station for any given length of time could not definitely be ascertained in advance, it was necessary to proceed almost entirely on the basis of previous estimates. The estimates worked out well for supplying food at the small outlying camps, but at the main base camp (Camp X) an additional amount of food had to be purchased during the summer. Fortunately, all ski-plane traffic and most of the mail flights were directed to this camp. Thus it was possible to obtain specially needed provisions without undue inconvenience or much extra expense.

The actual number of men on the ice field at any one time varied considerably until the end of June. (From then on there was a more or less stable nucleus of 15 men working at the upland camps.) Consequently, some of the earlier estimates had to be altered. If possible, this condition should, of course, be avoided. Provisions for an expedition of this type are not always conventional nor standard and therefore often can be obtained only by special contact or correspondence. Local dealers should be contacted at least six weeks in advance, so that they may stock up on the commodities which might otherwise not be carried in sufficient quantity in the food warehouses of Alaska.

* See "Progress Report of the Juneau Ice Field Research Project, 1948", edited by M. M. Miller, American Geographical Society, May 1949. Summary food report prepared by W.L.Miner, Section XII, p. 60-68, Appendix F.

** A total of 24 men took part in the overall 1949 field program either on a full time or a partial season basis. This included the three members of the low level ecology team whose food requirements and method of supply is not discussed in this present report.

With the exception of food transported by ski-equipped aircraft, all supplies were free-dropped or parachuted from airplanes flying 100 to 800 feet above the drop site. In general, most products remained relatively intact when tightly packaged and properly protected by some sort of cushioning against the initial shock of impact. It was found that canned goods survived best when cans of similar size were packaged together in strong wooden boxes. This arrangement seemed to provide increased structural strength to the package as a unit and eliminated the presence of any large air spaces into which the cans could shift. Any remaining cavities were filled with newspaper, rags or excelsior. When packaged thus, stout metal-strapped cardboard boxes survived the fall without much damage. Wooden crates tended to splinter. However, if they were of extra double construction and well strapped (by steel banding preferably), they served adequately. Such wooden containers also provided material for later use around the camps. As cardboard boxes, if left in the snow or exposed to rain for any length of time,weaken and collapse, they should be used only when a load is to be consolidated by the ground party immediately after delivery. An effective and efficient aerial supply of food could be accomplished by means of rigid military parachute equipment bundles or standardized containers directly supplied with parachute assemblies. This would eliminate much of the expense and time-consuming effort a party must devote to strapping and roping make-shift containers of miscellaneous commercial types and sizes.

Cereals, gelatins, puddings, and other powdered foods should always be placed in strong waterproof food bags to obviate the loss which usually accompanies the breaking of cardboard or paper containers and to prevent the hydration, congealing, and hardening of the powders. As mentioned in the 1948 expedition's report, chocolate candy should also be protected thoroughly by waterproof bags since chocolate loses its flavor when exposed to rain or snow. Transparent vinylite bags of the Army type have proved the strongest and lightest of the food bags. They may also be saved and re-used. If used double, they are very reliable. Rubberized nylon bags were likewise successfully utilized.

It is to be expected that in rugged glacier and mountain terrain some aerially dropped loads will be lost or destroyed. For this reason allowance was made, as in the previous expedition, for a loss of 10 per cent. (Actually the percentage loss in 1949 was about 20 per cent due to the excessively high elevation above the surface from which a number of the drops had to be made. This was occasioned by the unusual number of drops which had to be accomplished from flights conducted in poor or mediocre weather. At such time flat lighting on the glacier or snowfield's surface provided the pilot with little or no depth perception and hence for safety he had to fly relatively high.) It was most important that each container (particularly those scheduled for the smaller camps) contain as great a variety of foods as possible, as one particular item might be lost, causing inconvenience, a lowering of morale, or a deficiency in the diet. Therefore, (with allowance for the possible 10 per cent loss) enough food was purchased to provide 16 men with a normal field diet (based on approximately 3,600 to 4,000 calories per day) for 75 days. This totaled 1,200 man days of food for the season and was more than adequate for the summer's use.*

Although not generally considered a part of the regular research program, the quality of the diet, and the amount and variety of the food, play a very important role in the success of an expedition remaining in the field for a considerable length of time. Unusual climatic and living conditions and the existence of frequent spurts of concentrated physical activity during the summer necessitate the use of special foods emphasizing maximum caloric and energy content and minimizing bulk, weight, and heat giving qualities (e.g. fatty foods). In the past, where more back packing of supplies was the rule, weight and bulk maintained equal priority with the actual nature of the diet. However, with the advent of air-drop and ski-plane support, it appeared that such a balance might not be as necessary. The Juneau Ice Field program permitted experimentation in this regard. A more extensive and elaborate diet was planned and effected for the large base camps and a highly concentrated and lightweight diet was utilized by the parties working from the trail or from smaller outlying camps.

For morale reasons, it was hoped that the monotony of usual expedition diets might be relieved by two factors: (1) the existence of a main base camp (such as Camp X) to which members of the party could return from work elsewhere on the ice field and receive a more normal ration, with fresh potatoes, occasional fresh meat, etc,: and (2) the introduction, at all camps, of a few relative "delicacies," such as canned fruits, catsup, an occasional cob of fresh corn, etc. These foods met with hearty approval, However, there was a tendency to consume them during the early weeks of the field season. It had not been deemed necessary to have a specially designated cook, so that there was no specific control over this. As already suggested, however, it is clear that the proper distribution of these items would certainly bolster expedition morale, and hence proper control is worthy of special consideration.

In this context it might be added that the diet and menus used during the 1949 season (based largely on the 1948 expedition's experience) were entirely satisfactory and that there were few complaints from members of the party. The cases of C-Ration, provided by the Army Quartermaster Corps, also provided variety and in general were adequate in

* Again note that due to unforeseen circumstances there was a greater quantity used at the main base than anticipated (which required a few additional later purchases), but this was balanced out by the smaller quantities used at several of the other main camps. These additional supplies, however, provided extra rations for the 1950 and 1951 field parties to use at these other camp locations.

themselves - though perhaps less interesting and less enjoyable than the commercially purchased foods. They were effectively used, however, for emergency supply and quick delivery when needed. To take care of further emergency requests and to supplement camp supplies by aerial delivery on short notice, a set of special 21-man-day-food units packaged and "ready to go" were kept in the U.S. Forest Service warehouse in Juneau. The contents of such an emergency unit are itemized in Appendix II (1), together with a general listing of the food and quantities used at various camps throughout the season. An analysis of each category is also made in the next section of this report.

It is generally assumed that prices of food in the United States are considerably less than in Alaska. Investigation and experience, during the last several Juneau Ice Field expeditions, however, have proved that, if dealing in relatively large quantities, and if careful prior arrangements are made, products may be purchased in Alaska at an equivalent or even lower cost than if purchased directly in Seattle when shipping rates are added. Many items (i.e. dried fruit) were not available in Alaska in quantity, but could be obtained there if ordered six or more weeks in advance. Unfortunately in 1949 the very rapid development of the project during the late spring months and the continual changes in the number of its potential participating personnel made it impossible to order the full quantities of food before June 10th. This made it even more advisable to purchase a large proportion of the food in Alaska. But even at that - for experimental reasons and because the food committee chairman lived in Seattle - nearly half of the supply was shipped north from Seattle.

II. Food Analysis *

BEVERAGES: Tea and hot chocolate were the most popular hot beverages consumed by the party. The Schilling's tea bags proved superior to the weaker Lipton bags used in 1948. However, for main base camp operation it probably would be just as practical to provide bulk tea in tin cans for use in aluminum tea balls and thus eliminate the storage and waste problems which bag tea presents. Individual Nestle's hot chocolate containers were advantageous and popular. Most members of the project agreed that for field use flavor is improved by the addition of one tablespoon of powdered milk and one teaspoon of sugar. Kool-Aid was a favorite drink at all times and, although lacking in food value, it is a good medium for sugar. This factor, together with the popularity of the drink and its ease of preparation, justified its use. The

* For sizes, types, and manufacturers of food units discussed here, refer to Appendix I at end of this report.

Acknowledgment: The project extends special appreciation to Mr. Gus George of the Gus George Grocery in Juneau, and to Mr. John Gies, of the Gies, I.G.A. Market in Seattle. Without the interest and help of the staffs in each of these companies the gratifying success of the food program on the Juneau Ice Field Research Project during the 1949 season would have been much more difficult to achieve.

coffee drinkers used bulk coffee at the main base camp, while on the trail soluble coffee was preferred.

CEREALS: Unfortunately the compressed cereal discs so successfully used on the 1948 expedition (A Doughboy Industries Product) were no longer available on the commercial market. The 1948 party felt they were by far the finest type of cereal for expedition purposes, supplemented perhaps at times with Maltex brand cooked cereal. Roman meal was a favorite breakfast food in 1949 and provided roughage to counteract the many binding foods such as cheese, tea, biscuits, etc. Oatmeal and Cream of Wheat were moderately popular. Cereals should always be of the "quick cooking" type because of limited time during periods of good weather and heavy field work and also due to the ever-present necessity for conservation of stove fuel.

CHEESES: Unprocessed American cheese was found to have more flavor and appeal than processed commercial cheeses. Crated wheels of this cheese stood up surprisingly well under the stress of 500 foot "free-fall" air drops. Swiss cheese also provided an advisable and occasional variety and proved to be most popular on the trail.

SEASONINGS: It is important to have a surplus of salt on hand. Its value as a seasoning cannot be overestimated. Many foods, particularly cereal and macaroni, would be tasteless without it. Pepper was rarely used; but relish, catsup, and mustard were popular. These seasonings should be kept in tin containers and must be checked regularly for the presence of fermentation and spoiling, especially in such humid districts as the Juneau Ice Field in summer. Tomato sauce added flavor to macaroni and spaghetti.

SPREADS: Uncolored oleomargarine was popular not only as a spread, but also as seasoning; it spoils much less readily than butter would under such conditions. Added to cracker crumbs, it could be kneaded into a wholesome pie crust and with sugar and a teaspoonful of rum added, it provided an excellent sauce for the canned puddings. Honey butter was an excellent spread and the brand purchased seemed to last indefinitely, as did also the oleomargarine. The assorted jams were fine, but it is important that they be dropped in sturdy metal containers, preferably of small size.

BREADS: The arrival of aircraft, every few weeks, permitted the main base camp to be continually supplied with fresh bread. This bread was by far the most desirable and was always a good morale builder. It held up amazingly well under the aerial drop conditions. If properly crated, removed from the snow immediately and kept in the shade, it stayed fresh for many weeks under the natural refrigerating conditions which exist at a glacier's surface. Jersey milk biscuits were an excellent field bread and perhaps the most popular on the trail. However, they are relatively more expensive than other types and often were crumpled on the impact of "free" fall delivery from aircraft.

MEATS: Any and all meats were popular. On a vigorous expedition these are strength and heat givers. It was found that canned fowl was usually not worth the trouble of preparation nor the expense. Boneless ham, served twice during the summer, was popular and could be used for several successive meals. All the canned meats used were very good. The Oscar Mayer products proved to be excellent in quality. However, they were slightly more expensive than others and had too much waste can space because of the included Sac-o-sauce (also a reaction of the 1948 party). Cervalot frankfurters are high in protein and carbohydrate value and provided an excellent field lunch meat, one small unit roll being sufficient for three men for one meal. Slab bacon and hamburger remained fresh if stored in the ice and were, of course, enthusiastically received. Sardines were good for field parties. Scandinavian sardines were much more palatable than the American Variety but were also twice as expensive.

SOUPS: Quick cooking dehydrated soups of the regular commercial variety were used. Three types were equally popular - pea, vegetable, and chicken noodle. The pea soup was improved with the addition of powdered milk. However, they were all perfectly satisfactory and provided sufficient variety for field use without the addition of other ingredients.

MACARONI AND SPAGHETTI: The bulk and the time necessary for their preparation makes these foods unwieldy except in large main base camps. Some of the quick-cooking spaghetti, however, (Kraft Dinner, etc.) would be excellent for small parties. Although somewhat bulky, they are still quite light in weight and provide a readily prepared and filling dish.

DAIRY PRODUCTS: Powdered eggs and powdered milk were both excellent products. Although they do not retain the true taste of the original food, this is of small import as a field party usually develops a taste for them within a few weeks. The eggs, when well seasoned, were suitable if eaten alone, but the addition of milk was preferred when the eggs were combined with other food products such as flour for baking, etc. (As care in mixing must be taken to avoid lumping an egg beater thus became an indispensible tool at the main camps.)

DESSERTS: Canned fig pudding is high in caloric content and a very delicious dessert. It may also be used as a main unit for lunches. One can of Heinz provided sufficient dessert for five men. Jell-O and puddings were also popular, but had to be prepared in the morning and left standing in the snow for some hours. Unfortunately the powder of these desserts forms a solidly hard mass when left in contact with moisture, and therefore, if not properly stored at the camp, they lose flavor and become difficult to prepare. Dried fruits were often used as desserts and made excellent fillings for cracker crumb pies. Tapioca was not particularly well liked and solidified under the influence of moisture in the area.

CANNED FRUITS: Canned fruit cocktail, peaches, and pears provided handy and delicious food. As these were considered to be "luxury" items, they were not eaten in quantity. They were useful morale items, however, and also filled in an occasional dietary gap. Although their weight makes them unwieldy for use except at large camps, they do provide variety in the diet and are excellent in Jell-O. Olives and the occasional use of canned mushrooms also provided variety and as "luxury" items helped to make an otherwise mundane meal seem "special."

FRESH VEGETABLES: Fresh vegetables were dropped to Camps IV and X in order to test their value under field conditions. Beets, onions, potatoes (both dried and fresh), and on several occasions fresh corn on the cob and radishes held up well under free drop conditions. The potatoes and onions remained relatively fresh for two months when kept dry and stored in ice. These vegetables were not as expensive as their dehydrated counterparts and added interest to the diet. However, large quantities could not be kept on hand because of the danger of spoilage and because supplies were not readily available in Juneau.* Their bulk made them advisable for use only in main base camps. Fresh vegetables also took a longer time to prepare, i.e., cleaning, etc., than the dehydrated variety (not considering the time necessary to soak dried vegetables prior to cooking as a factor). Fresh fruits on several occasions were also brought in, but only on the ski-plane since it was impossible to drop them successfully. This therefore limited their use to "rare occasions."

DRIED FRUIT: Dried fruit is one of the major staples on an expedition of this nature. They are very practical for base and field camps. They may be eaten dried or cooked in a variety of ways, and may be served either as an appetizing compote for breakfast, a "munch" at noon, or a satisfying dessert at night. This versatility makes them one of the most ideal field foods. Dried fruit is a suitable laxative and is very high in energy value. Apricots, raisins, and peaches seemed to be most popular during the 1949 field season. Dried apples, served with a sauce, provided an occasional dinner time variety.

FLOUR: A small amount of pancake flour is useful at a main base. Although usually there is not enough time available for preparation, they are excellent when served with jam and oleomargarine. Pancakes are best used as a "morale" food during blizzard or stormy weather. Regular cooking flour was quite desirable in the preparation of gravy, occasionally used on the fresh potatoes at Camps IV and X. Biscuit flour (Bisquick) was also good and is worthy of inclusion in future lists for main base camps.

* An attempt was made in early summer to have several crates of fresh vegetables shipped to the project by the Rogge Commission markets in Seattle. These were stored in a cold storage locker in Juneau. However, it proved to be an impractical plan due to the unpredictable weather and consequent irregularity of flight schedules to the ice field from Juneau.

SWEETS: Sweets serve as the major energy staple, good in any form. Sugar should be available at all times in large quantities (with more than ample reserves), not only for use as flavoring but because of its importance in the diet. Chocolate candy becomes monotonous, but is the most concentrated form of energy. As previously mentioned, it loses flavor in contact with snow or water and hence care must be exercised in storage. Chocolate may be varied with nuts, candy chews, etc. Peanuts and other separate nuts provide variety, but are expensive. On a long expedition, however, they are a "must."

DRIED VEGETABLES: Dehydrated vegetables, without prior preparation, take a long time to cook. (However, if left soaking in water all day, they may be cooked in less than an hour.) A pressure cooker is most advisable. Seasoning with oleomargarine, salt, and pepper greatly improves their flavor. French's Instant Potatoes, although expensive, taste better and are more easily prepared than the brand, Speed-Tatoes, and were an exceedingly popular food. They retained their original flavor remarkably well, and, because of this and the rapidity with which they could be prepared on this 1949 expedition, they became perhaps the most popular bulk food used on the project during the entire summer season.

APPENDIX I.

SOURCE AND PURCHASE LIST

PRODUCT, COMMERCIAL NAME & MANUFACTURING SOURCE	TOTAL WEIGHT	IND. WEIGHT	SOURCE	REMARKS ON CONTAINER & AIR DROP CONSIDERATIONS.
BEVERAGES:				
KOOL-ADE Perkins Products Co. Chicago, Ill.	100 Ind. Pkgs.		G.G.* Juneau	Paper packages Strength - good
ORANGE PEKOE TEA Schilling Products Co. San Francisco, Calif.	1900 bags	800/ctn.	G.G.	Individual bags Strength - poor
NESTLES EVER-READY COCOA Felton, N.Y.	800 pkgs.	1 1/8oz.	I.G.A.* Seattle	Individual envelopes Strength - poor
HILLS BROS. COFFEE Regular ground San Francisco, Calif.	20 lbs.	1 lb.	G.G.	Canned
STEERO BOUILLON CUBES Ozone Park, N.Y.	400 cubes	100 cubes	I.G.A.	Canned, individual Cubes wrapped
BREADS:				
JERSEY BREAD Pilot Bread Corp., Seattle, Wash.	100 lbs.	12 1/2 lbs.	G.G.	Rect. cardboard boxes Strength - poor
FRESH BREAD Purity Bakery Juneau, Alaska	90 lbs.	1 lb.	Juneau	Paper wrappings Strength-negligible
CEREALS:				
ALBERS QUICK OATS Albers Milling Co. Seattle, Wash.	34 lbs.	1 lb.4oz.	I.G.A.	Cylindrical card-board box Strength - fair
CREAM OF WHEAT Cream of Wheat Inc. Minneapolis, Minn.	30 lbs.	1 lb.12oz.	I.G.A.	Rect. cardboard boxes Strength - fair
ROMAN MEAL Roman Meal Co. Tacoma, Wash.	21 lbs.	1 lb.12oz.	G.G.	Rect. cardboard box Strength - fair
CLEANSERS:				
IVORY SOAP Procter & Gamble Inc. Detroit, Mich.	----	-----	G.G.	Paper wrappings Strength - fair

* G.G. - Gus George Grocery, Juneau;
I.G.A. - Gies I.G.A. Market in Seattle.

PRODUCT, COMMERCIAL NAME & MANUFACTURING SOURCE	TOTAL WEIGHT	IND. WEIGHT	SOURCE	REMARKS ON CONTAINER AND AIR DROP CONSIDERATIONS
CLEANSERS: (continued)				
BRILLO PADS Brooklyn, N.Y.	14 boxes	5 pads	I.G.A.	Rect. cardboard boxes strength - poor
CHEESES:				
DARIGOLD CHEDDAR Seattle, Wash.	47 lbs.	23 1/2 lbs.	I.G.A.	Wood crated wheels strength - good
DARIGOLD PROCESSED Seattle, Wash.	30 lbs.	5 lb.s	I.G.A.	Cardboard boxes strength - poor
DAIRY PRODUCTS:				
DARIGOLD POWDERED MILK Darigold Dairy Prod's. Seattle, Wash.	55 lbs.	1 lb.	I.G.A.	Canned strength - poor
POWDERED EGGS Washington Coop. Ass'n, Seattle, Wash.	50 lbs.	25 lbs.	I.G.A.	Rect. cardboard boxes
DESSERTS:				
FIG PUDDING Heinz Packing Co. Pittsburgh, Pa.	72 lbs.	----	I.G.A.	Canned
JELLO Jello Co. New York, N.Y.	50 pkgs.	3 oz.	G.G.	Rect. cardboard boxes
JELLO PUDDING Jello Co. New York, N.Y.	24 pkgs.	4 oz.	G.G.	Rect. cardboard boxes
TAPIOCA Minute Tapioca New York, N.Y.	6 1/2 lbs.	8 oz.	I.G.A.	Rect. cardboard boxes
FRUITS: (CANNED)				
YELLOW CLING PEACHES Remarkable Products San Francisco, Calif.	44 lbs.	1 lb. 13 oz.	G.G.	Canned
BARTLETT PEARS Remarkable Products San Francisco, Calif.	44 lbs.	1 lb. 13 oz.	G.G.	Canned
GROGAN'S RIPE OLIVES	6 lbs.	9 oz.	G.G.	Canned
FRUITS: (DRIED)				
PRUNES Sunsweet Co. San Jose, Calif.	54 lbs.	2 lbs.	I.G.A.	Rect. cardboard boxes strength - good
SEEDLESS RAISINS Del Monte Dried Fruits San Francisco, Calif.	30 lbs.	15 oz.	I.G.A.	Rect. cardboard boxes strength - good

PRODUCT, COMMERCIAL NAME & MANUFACTURING SOURCE	TOTAL WEIGHT	IND. WEIGHT	SOURCE	REMARKS ON CONTAINER AND AIR DROP CONSIDERATIONS
FRUITS: (DRIED) continued				
APPLES Valley Evaporation Co. Tacoma, Wash.	12 lbs.	8 oz.	I.G.A.	Rect. cardboard boxes strength - good
PEACHES Sunsweet Co. San Jose, Calif.	24 lbs.	11 oz.	I.G.A. G.G.	Rect. cardboard boxes strength - good
APRICOTS Sunsweet Co. San Jose, Calif.	60 lbs.	20 lbs.	G.G.	Cardboard cartons, inner bag strength - good
MEATS:				
BEEF Oscar Mayer Packing Co., Chicago, Ill.	116 lbs.	12 oz.	I.G.A.	Canned
PORK Oscar Mayer Packing Co., Chicago, Ill.	116 lbs.	12 oz.	I.G.A.	Canned
WIENERS Oscar Mayer Packing Co., Chicago, Ill.	108 lbs.	12 oz.	I.G.A.	Canned
SPAM Hormel Packing Co. Austin, Minn.	36 lbs.	12 oz.	I.G.A.	Canned
PREM Swift Packing Co. Chicago, Ill.	54 lbs.	12 oz.	I.G.A.	Canned
EMERGENCY PEMMICAN Hain Pure Food Co. Los Angeles, Calif.	7 lbs.	3 1/2 oz.	Rec. Co-op*	Canned
RIND BACON Armour Packing Co. Seattle, Wash.	150 lbs.	----	I.G.A.	Cardboard boxes
CERVALOT Armour Packing Co. Seattle, Wash.	40	-----	I.G.A.	Cardboard boxes Ind. frankfurters
CORNED BEEF HASH Libby-McNeil-Libby Co. Chicago, Ill.	30 lbs.	12 oz.	I.G.A.	Canned
CORNED BRISKET BEEF Libby-McNeil-Libby Co. Chicago, Ill.	6 lbs.	2 lbs.	G.G.	Canned
SARDINES Port Clyde Packing Co. Port Clyde, Maine	60 lbs.	3-1/4 oz.	G.G.	Canned
BONELESS HAM Decker Packing Co.	16 lbs.	8 lbs. 5 oz.	G.G.	Canned
SWANSON'S WHOLE CHICKEN Omaha, Nebraska	9 lbs. 12 oz.	3 lbs. 4 oz.	G.G.	Canned

* Recreational Equipment Cooperative, 523 Pike Street, Seattle 1, Wash.

PRODUCT, COMMERCIAL NAME & MANUFACTURING SOURCE	TOTAL WEIGHT	IND. WEIGHT	SOURCE	REMARKS ON CONTAINER AND AIR DROP CONSIDERATIONS.
MACARONIS:				
MACARONI & SPAGHETTI Mission Company Seattle, Wash.	36 lbs.	1 lb. 8 oz.	I.G.A.	Cellophane wrapper
KRAFT DINNER Kraft, Inc. Chicago, Ill.	10 lbs. 8 oz.	7-1/2 oz.	I.G.A.	Rect. cardboard boxes strength - fair
PANCAKE FLOUR:				
Alliers Mills Seattle, Wash.	15 lbs.	1 lb. 4 oz.	G.G.	Rect. cardboard boxes strength - fair
SEASONINGS:				
PEPPER Schilling Products Co. San Francisco, Calif	18 oz.	2 & 4 oz.	G.G.	Metal spice containers strength - good
MORTON'S SALT San Francisco, Calif.	32 lbs.	4 lbs.	G.G.	Heavy paper bags strength - fair
FRENCH'S MUSTARD Rochester, N.Y.	81 oz.	9 oz.	G.G.	Glass jars strength poor; not advisable
NALLEY'S RELISH Tacoma, Wash.	10 lbs.	12oz.	I.G.A.	Glass jars; strength poor; not advisable.
HUNT'S TOMATO SAUCE San Francisco, Calif.	10 lbs.	8 oz.	I.G.A.	Cans
DENNISON'S TOMATO CATSUP Seattle, Wash.	35lbs. 15 oz.	7 lbs. 3 oz.	G.G.	Cans -weak; too large & bulky for weight content.
SOUPS:				
LIPTON'S CHICKEN NOODLE Hoboken, N.J.	9 lbs.	2 oz.	I.G.A.	Individual envelopes strength - good
BETTY CROCKER PEA SOUP Minneapolis, Minn.	18 lbs.	4 oz.	I.G.A.	Cardboard boxes strength - fair
BETTY CROCKER VEG.NOODLE	10lbs. 2 oz.	2-1/4 oz.	I.G.A.	Cardboard boxes strength - fair.
SPREADS:				
Durkee's OLEOMARGARINE Seattle, Wash.	90 lbs.	1 lb.	I.G.A.	Rect. cardboard boxes strength - poor
S & W ORANGE MARMALADE San Francisco, Calif.	4 lbs.	1 lb.	I.G.A.	Glass jars; strength-weak; not advisable
HONEY-CREME SPREAD Sioux Bee Co. Tacoma, Wash.	72 lbs.	1 lb.	I.G.A.	Cardboard cup strength - fair
AYLMER ASSORTED JAMS British Columbia, Canada.	108	4 lbs.	G.G.	Cans -weak; too lg. and bulky for weight content

PRODUCT, COMMERCIAL NAME & MANUFACTURING SOURCE	TOTAL WEIGHT	IND. WEIGHT	SOURCE	REMARKS ON CONTAINER AND AIR DROP CONSIDERATIONS
SWEETS:				
ELMER'S COFFEE CANDY New Orleans, La.	4 lbs.	8 oz.	G.G.	Canned
ARISTOCRAT NUTS National Nut Co. Oakland, Calif.	20 lbs.	1 lb.	G.G.	Cardboard can strength - poor
BAKER'S SWEET CHOCOLATE Dorchester, Mass.	72 oz.	12 oz.	G.G.	Cardboard can strength - good
C & H SUGAR San Francisco, Calif.	225 lbs.	25 lbs.	G.G.	White sacks strength - poor
PLANTER'S PEANUTS San Francisco, Calif.	4 lbs.	4 oz.	G.G.	Canned
HERSHEY'S CHOCOLATE(Assrt) Hershey, Pa.	140 lbs.	-	G.G.	Ind. wrapped strength - poor
CHOCOLATE WAFERS National Biscuit Co. New York, N.Y.	7-1/2 lbs.	10 oz.	G.G.	Canned
ASSORTED HARD & GUM CANDY Sweet Candy Co.	25 lbs.	9 oz.	G.G.	Cellophane sacks strength - poor
LANG'S POPCORN Seattle, Wash.	12-1/2 lbs.	10 oz.	G.G.	Jars
LANG'S PEANUTS Seattle, Wash.	8 lbs. 12 oz.	7 oz.	G.G.	Jars
TOILET PAPER:				
M.D. Toilet Rolls Bellingham, Wash.	50 rolls	650 sts.	G.G.	Paper wrapped
VEGETABLES (DRIED):				
SPEED-TATOES Seattle, Wash.	21 lbs.	3-1/2 oz.	I.G.A.	Canned
ONIONS Wash. Dehydrating Food Co.	9 lbs.	7 oz.	Rec. Co-op	Canned
BEETS,CARROTS,PARSNIPS Bullman's Company Vernon, B.C.	5 lbs.	2-1/2 oz.	G.G.	Canned
FRENCH'S INSTANT POTATOES Rochester, N.Y.	4 lbs.	8 oz.	G.G.	Rect. Cardboard box strength - poor
FRESH VEGETABLES:				
BEETS CABBAGE CELERY CUCUMBERS ONIONS (DRY) ONIONS (GREEN) RADISHES	4 cases assor.		Rogge Comm*	Wooden crates strength - poor
POTATOES Washington U.S. No.1 Dahlgren Co. Seattle, Wash.	150 lbs.	50 lbs.	G.G.	Gunny sacks strength - good

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* Rogge Commission, vegetable and fruit markets, shipper from Seattle.

APPENDIX II.

ICE FIELD FOOD AND QUANTITY DISTRIBUTION LISTS

I. EMERGENCY FOOD UNIT - 21 man days*

Beverages	
Cocoa	25 pkgs. ind.
Coffee	1 lb.
Kool-ade	4 pkgs.
Tea	50 bags
Breads	
Jersey bread	1 ctn., large
Cereals	
Cream of wheat, or Maltex	1 box
Oatmeal	1 box
Cheeses	
Processed Swiss-American	5 lbs.
Dairy Products	
Eggs (Powdered)	2 lbs.
Milk (Powdered)	2 lbs.
Desserts	
Fig Pudding	3 cans
Fruits (dried)	
Apricots	2 lbs.
Peaches	2 lbs.
Prunes	2 lbs.
Raisins	3 lbs.
Fruits (canned)	
Pears	2 cans
Peaches	2 cans
Meats	
Bacon	3 lbs.
Beef	4 cans
Corned Beef Hash	2 cans
Cervalot	3 units
Pork	4 cans
Prem	2 cans
Sardines	12 cans
Wieners	2 cans
Seasoning	
Salt	1 lb.
Sweets	
Peanuts	3 cans
Sugar	5 lbs.
Hershey (small)	64 bars

* Dropped to outlying camps XIA, XII, and VI, and also at camps X and IV when needed to supplement the rations there. Six cases of Q.M.C, C-ration, the equivalent of 36 man days food, were also dropped at outlying camps.

EMERGENCY UNIT (Continued)

Vegetables (canned)		
Corn	2 cans	
String beans	2 cans	
Peas, and carrots	2 cans; 2 cans	
Dried potatoes, French's Instant	2 8-oz. boxes	
Soups		
Bouillon	25 cubes	
Chicken Noodle	4 pkgs.	
Pea	3 boxes	
Vegetable	3 boxes	

II (A) CAMP X PRELIMINARY DROP FOR ADVANCE PARTY IN JUNE, 1950

Beverages		
Cocoa	15 pkgs.	
Breads		
B - 2 Crackers	10 cans	
Cereals		
Oatmeal	2 boxes	
Cheese		
American	5 lbs.	
Dairy Products		
Milk (Powdered)	2 cans	2 lbs.
C-3 Ration	3 case units	
Desserts		
Jello	6 boxes	
Jello Pudding	2 boxes	
Fruit (dried)		
Peaches	1 box	
Prunes	1 box	
Raisins	1 box	
Meats		
Cervalot	4 units	
Pemmican	2 cans	
Prem	2 cans	
Sardines	11 cans	
Pancake Flour	1 box	
Seasonings		
Salt	1 bag	2 lbs.
Soups		
Chicken Noodle	3 pkgs.	
Pea	2 boxes	
Spreads		
Honey Butter	2 cans	2 lbs.
Sweets		
Sugar	3 lbs.	
Toilet Roll	3 rolls	
Vegetables		
Stew Mix	2 bags	

II (B) CAMP X AND XA TYPICAL SUPPLIES IN A MAIN DELIVERY OF APPROXIMATELY 375 MAN-DAYS FOOD*

Beverages		
Cocoa	12 bags	
Coffee	7 cans	7 lbs
Kool-ade	48 pkgs.	
Tea	700 bags	
Breads		
Jersey bread	8 ctns.	
Fresh bread	45 loaves	68 lbs.
Cereals		
Cream of Wheat	13 boxes	
Oatmeal	12 boxes	
Roman meal	9 boxes	
Cheeses		
Cheddar	1 wheel	27 lbs.
American	10 lbs.	
C-3 Ration	4 case units (24 man days)	
Cleansers		
Brillo	5 boxes	
Soap	2 bars	
Dairy Products		
Eggs (Powdered)	1 case	30 lbs.
Milk (Powdered)	33 cans	33 lbs.
Desserts		
Fig pudding	24 cans	
Jello	11 boxes	
Jello pudding	5 boxes	
Tapioca	3 boxes	
Fruits (dried)		
Apricots	1 box	30 lbs.
Apples	7 boxes	
Peaches	8 boxes	
Prunes	10 boxes	
Raisins	10 boxes	
Fruits (canned)		
Fruit cocktail	48 cans	
Olives	14 cans	
Peaches	8 cans	
Pears	10 cans	
Fruits (fresh)**		
Apples	48 apples	
Apricots	1 basket	
Casaba melon	2 melons	
Cantaloupe	2 crates	

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* Most of these included items are more of less those needed for 4 men for 100 days (Note: Camp XA was Glacier Study camp on upper Taku névé 1/2 mile west of Camp X)

** Morale items flown in on ski-plane in mid-summer.

II (b) Continued

Fruits (fresh) continued		
Grapes	2 crates	
Watermelon	1 melon	
Macaronis		
Kraft Dinner	8 boxes	
Macaroni	7 bags	
Meats		
Bacon	150 lbs.	
Beef	48 cans	
Cervalot	23 units	
Chicken	2 cans	
Corned beef hash	10 cans	
Ham	1 can	
Hamburger (fresh)	40 lbs.	
Pemmican (emergency)	7 cans, small	
Pork	48 cans	
Prem	24 cans	
Spam	12 cans	
Sardines	83 cans	
Wieners	48 cans	
Pancake Flour	9 boxes	
Rice	10 lbs.	
Seasonings		
Catsup	2 cans	2 gals.
Mustard	2 jars	
Pepper	2 cans	6 oz.
Relish	2 cans	2 qts.
Salt	3 bags	6 lbs.
Tomato Sauce	18 cans	
Soups		
Bouillon	100 cubes	
Chicken Noodle	70 pdgs.	
Pea	24 pkgs.	
Vegetable	25 pkgs.	
Spreads		
Honey Butter	32 cans	32 lbs.
Jam, assorted flavors	8 cans	
Oleomargarine	48 lbs.	
Sweets		
Candy Kisses	2 bags	
Chocolate wafers	3 cans	
Chocolate mints	1 box	
Fruit bublets	1 can	
Gum drops	1 bag	
Hard Candy	3 jars	
Hershey (large)	32 bars	
Hershey (small)	192 bars	
Licorice	1 bag	
Nuts (assorted)	6 cans	6 lbs.
Peanuts	6 cans	
Popcorn	2 cans	5 qts
Toilet Roll	17 rolls	

II (B) (Continued)

Vegetables (dehydrated)		
Carrots	1 bag	1 lb. 5 oz.
Onions	8 cans	
Potatoes	36 cans	
Stew mix	4 bags	
Vegetables (fresh)		
Beets, green onions radishes, celery, carrots	10 crates	
Potatoes	4 sacks	200 lbs.
Onions (dry)	1 case	20 lbs.

III. SUPPLIES AND QUANTITIES AT OUTLYING CAMPS, 1949

(Additional supplies, in variety similar to the Camp 10 list, and in proportion as noted below, were delivered by aircraft to the following camps.*)

Taku Lodge Base (Taku River)	100 man days rations
Camp I (Twin Glacier Lake route camp)	30 man days rations
Camp IV (Upper Twin Gl. névé. A major base camp)	170 man days rations
Camp VI (Vicinity Devil's Paw Pk. geological camp)	40 man days rations
Camp IX (Far northern end Taku Gl.)	60 man days rations
Camp XIA (Confluence E. branch Taku Gl. route and seismic camp)	70 man days rations
Camp XII (Hole-in-the-Wall Gl. Ridge)	130 man days rations
Camp XIV (South end Taku Range, geological camp)	50 man days rations
U.S. Forest Service Warehouse, Juneau	Emergency rations 81 man days rations (used at camps XII and IX) 30 man days rations C-3 delivered to Camps X, XII, IV, XA, and I.

* The actual listings of types and amounts of these supplies may be obtained in the Department of Exploration and Field Research, American Geographical Society, New York. Note also that 460 man days of rations were provided at Camps X and XA .

JUNEAU ICE FIELD RESEARCH PROJECT, ALASKA

1950

FOOD REPORT

Prepared by Frederick A. Small

Chairman, Food Committee

With the aid of members of the expedition

CONTENTS

I. Procedures and Operations

II. Analysis of Food Items Used

Appendix 1. Supplies and Distribution

Appendix 2. Emergency Food Unit.

JUNEAU ICE FIELD RESEARCH PROJECT

FOOD REPORT 1950

I. Procedures and Operations:

The planning, purchasing and delivery of food for the 1950 expedition were greatly simplified by referring to the Juneau Ice Field Research Project food reports of the 1948 and 1949 field seasons. Unpredictable circumstances, however, such as the Korean war, fluctuations in the size of the party throughout the summer, and movement of personnel from one camp to another according to the dictates of weather, made it impossible for exact food accounting to be achieved.

It was necessary to allow 10 percent leeway to account for these fluctuations and to compensate for any of the aerially dropped loads that might be lost or destroyed upon impact in the glacial and mountain terrain. It was hoped that this loss would be lessened by the use of parachute "equipment bundles" which would cushion the fall of the more breakable supplies. In all, thirty-two parachute food containers were dropped to camps on the ice field. Only one, which struck a rock outcrop after having broken loose from its parachute, was severely damaged. Although a 50 per cent loss resulted in this particular case and although there were a few minor losses in other bundles, there was no burden placed on the planned diet. Each food bundle was packed with a variety of different foods so the loss of one particular package would not cause a serious deficiency in diet or a possible reduction in morale.

All parachutes were hand packed by the expedition personnel at the Juneau Air Port and all functioned properly. Approximately 300 free-fall bundles were also dropped from aircraft flying between 25 and 300 feet above the glacier and snow field landing surface. About a 30 per cent loss was suffered by food contained in these. The damage in these cases was excessive to canned fruits which, being too heavy for free-fall, crushed upon impact even where well padded with newspapers and other wadding. Potatoes and onions presented a packing problem which could have been solved if there had been a surplus of para-packs. Instead these foods were dropped free-fall and, although plenty of padding was added, heavy losses still ensued. Salt and rice came apart due to the excessive stress. It was found that such items survived the impact quite well if the bag was three-quarters filled and placed in a second vinylite bag.

A serious problem was encountered when notification was received, after the party was already on the ice field, that the expected Army 5 in 1 and C-4 food rations had been diverted to Korea. Since they were to constitute the bulk of the expeditionary food for the summer, it was immediately necessary to take inventory of 600 man days of commercially purchased food already on hand and to supplement this with additional supplies ordered by radio to Juneau. The Gus George Grocery gave the project very reasonable purchase prices and also much valuable help in the selecting, packaging, and in the expeditious delivery of large quantities of food to the airport. With the aid of the Air Force's 10th Rescue Squadron C-47 ski-plane, fortunately then on hand, frequent trips were made to the glacier air strip camp (10 B). It was possible thus to fulfill these supply and logistic needs with much less difficulty than was at first expected.

Because of natural refrigeration available in the névé and because of the large number of personnel working during July and August at the two primary base camps, it was possible to use fresh meats, eggs, vegetables, fruits, and bread. These items, which had originally not been anticipated, not only enhanced the quality of the diet but also improved morale.

The project did not employ a full time cook at any camp. During June and July the food was prepared by various members of the expedition, who either cooked for themselves or for others on a "take-turn" basis. This resulted in 'choice items' being used first and as a consequence the menus were not always balanced. However, in August, when there was the greatest number of men on the ice field, a more systematic provision (which allowed for two men rotating as cooks) considerably improved this situation at the glacier air strip camp, where the main ice research program was then underway. The food served received the highest compliments from all concerned, with particular praise for the variety in the menus. Where there are many men at one camp, the value of assigning a cook cannot be overestimated. As well as improving field work efficiency, it raises morale, eases the handling of food, prevents wastage and results in a more balanced diet. Needless to say, it can also facilitate the problem of supply bookkeeping. The cooks should set up a special tent to handle all incoming food supplies, and maintain a constant and readily available inventory so that all food can be continually accounted for.

The landing of supplies at the glacier camp placed a certain strain on personnel since all food consigned to Camp 10 had to be sledged and backpacked 1-1/4 miles from the air strip. This resulted in a tendency to take only 'choice' foods for consumption, leaving behind heavy canned goods such as vegetables and juices, etc., which were needed to round out the diet. For a while, therefore, Camp 10 did not have the variety of foods which was available at the air strip camp. Such facts point up the real need for the commissary officer not only to keep himself appraised of transportation facilities available between camps and to utilize them efficiently, but also to keep the field leader informed of such requirements.

The supply of the outlying camps was facilitated by the use of emergency food units comprising 21 man days of food per unit (see 1949 report). Nine of these food bundles were made up; seven were eventually parachuted to the outlying camps and two were kept in reserve at the U.S. Forest Service warehouse in Juneau. Although these units when dropped in the field were exposed to snow, rain, and heavy moisture, the para-pack containers kept the food in excellent condition, and no spoilage occurred.

It was found in preparing emergency bundles for aerial delivery that it was best to put the goods in a duffel bag first with the heavier canned goods well padded at each end and the light foods (canned milk, dried eggs, cereals, candy) packed tightly with excelsior inside a sturdy box. Packaged thus, with the para-pack attached to the chute in such a manner that it would land on its side, little damage resulted.

Because of the careful dietetic consideration given in 1949 to the food in the 21 man day units, these were used as a basic guide in ordering larger quantities for the main camps. This proved to be quite satisfactory, especially when prearranged substitutes were included in the larger orders.

Enough food was purchased to provide 14-men with a normal field diet (based on approximately 4000 to 4500 calories) for 100 days. This totaled 1,400 man days of food for the season.* The attached appendices give further information and details.

II. Analysis of Food Items Used

Beverages: Tea seemed to be the most popular hot beverage consumed by the 1950 summer field party. Coffee ran a close second. Soluble coffee was preferred to regular coffee because of ease in preparation. Individual Nestle's hot chocolate containers were used most widely; prepared both hot and cold and with the addition of one tablespoon of powdered milk and one teaspoon of sugar. Kool-ade was a favorite drink as a thirst quencher and a vehicle for sugar, but it was usually only preferred on hot days.

Cereals: It was found that members of this particular field party were only moderately interested in the 'hot' cereals such as Roman meal, Oatmeal and the less popular Cream of Wheat. This was due to the fact that there was a great variety of cold cereals in individual containers, which made both preparation and clean up after the meal quite simple. This became most important when time was a factor and when there was not a scheduled cook at the camp in question. Cold cereals were a rich energy food, although admittedly they were too bulky. It would not ordinarily be possible to back pack such bulky items into the ice field, or for any extensive field work on the trail; however, because the ski-plane made frequent trips to the main base camp and because this type of cereal was so exceptionally light it proved to be quite a worth while investment.

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* This did not include the 230 man days of Army C-4 ration and 125 man days of 5 in 1 ration provided by the Quartermaster Corps for test. These were reserved primarily for emergency use and as supplies for outlying camps (see Appendix 1.).

Cheeses: No great variety of cheese was needed during this season since the processed cheese alone seemed adequately to have served the needs of the individual members. It was suggested that grated cheese for use on the dry spaghetti would have improved the flavor considerably. Perhaps the lack of concern for variety in this item may be attributed to the fact that there was less trail work for the majority of the members of this expedition than in 1949, because of the heavier concentration on detailed laboratory studies, ice drilling, etc., at several of the main camps.

Seasonings: Salt, pepper, hot tomato sauce, relish, pickles, mustard, and ketchup were again enjoyed by all. Worcester-shire and "A-1" sauces for use on fresh hamburger meat, etc., and in soups was favored. Of these condiments, salt is by far the most important. It is well to have an extra supply on hand. An expedition undergoing rigorous work in an area where light weight foods are essential, because of logistic limitations, can get along quite well without any seasoning but salt; the latter, however, is always an essential item.

Spreads: Nucuo, oleomargarine, and butter were used extensively on bread and biscuits as well as with vegetables and soups. Jams of all kinds were the most popular spreads. Loganberry and apricot jams were but moderately liked. In spite of its extreme popularity on the 1949 expedition, considerable difficulty was experienced with homey butter this year; firstly because of the large quantity purchased (too much on hand and hence the group tired of it more easily); secondly because the brand on hand absorbed moisture too easily and became overly messy. Also the cardboard containers did not stand up particularly well, and unless they were kept in cold storage the contents softened and seeped to the outside. Its flavor, however, is excellent and if it could be obtained in cans it would be a very popular and practical food.

Breads: The Jersey bread biscuits which were sealed by solder into five gallon tins last season were opened and found amazingly fresh and palatable. Although fresh bread was preferred, the biscuits (both Jersey and Pilot types) were eaten with enjoyment and on occasions were crumbled and made into an excellent pie crust together with butter and a dash of flour. Uncut bread of all kinds, if kept outside and away from moisture lasted four or five weeks.

Meats: It is again recommended that in canned meats, where a sack-of sauce is included, the space taken up by the sauce would be better used by additional meat. There was a surplus of sardines this year due to the fact that other fresh meats could be easily provided by the air lift. Slab bacon and hamburger kept well, if left outside and buried in the ice. All meats were enjoyed with the exception of canned pork, which was slightly in over balance of supply and hence lost its appeal.

Soups: Soups were not generally as popular as expected until later on in the season when the weather became colder. But they did serve as a fine base for stews. Vegetable-noodle and tomato soup were the favorites. Powdered milk if properly mixed added flavor.

Macaroni and Spaghetti: There was actually not enough dry spaghetti or macaroni on hand. Quick cooking spaghetti (Kraft Dinners, etc.) would have been excellent especially with the grated cheese and hamburger meat. (These would also go well with dried and powdered hamburger which should not be an expensive item to provide when weight limitations become a factor.)

Dairy Products: Powdered eggs were used by relatively few people during this season. This is explained by the fact that less meals were prepared on the trail than in 1949. Powdered eggs are difficult to prepare properly in large quantities. With the aid of an egg-beater, powdered milk was used in large quantities on the dry cereals, in soups, and drinks. It was even enjoyed by many who drank it alone - mixed in water. Care must be exercised in cleaning the container each time it has been used, since if the milk lumps are not removed they will turn sour quickly.

Desserts: Canned fig pudding was again a favorite when used with sweet sauce. The various canned fruit varieties were also used frequently and with success. Jello puddings were a favorite, but difficult to prepare. (see under sweets).

Canned Fruits: Fruits were popular and always gave the impression of being a 'special' item when served. Canned mixed fruit was the most popular and in small individual cans was widely appreciated on the trail.

Dried Fruit: Applesauce was by far the most popular especially when plenty of sugar was added. If kept in a covered pot it remained fresh for over a week. Raisins, currants, and peaches were used on the trail and provided the suitable laxative necessary to cut the many binding foods. Prunes, like applesauce, kept well even after soaking. Before use they were usually boiled and then left to soak for about eight hours. On the trail, of course, they were eaten dry.

Fresh Fruits: Cantaloupe, honey-dew melon, and watermelon were "choice items", unexpectedly provided on a few occasions. Naturally they were the most popular, along with the few grapes and plums which were supplied several times in "morale packages" brought in by the ski-plane.

These were distinctly "luxury" items, but the tremendous boost they gave to "morale" warrants their mention here.

Fresh Vegetables: On those occasions when the ski-plane came in after an absence of 3 to 4 weeks, the lettuce, beets, onions, radishes, corn-on-the-cob, spinach, potatoes, and tomatoes which were brought in all added variety and freshness which made the summer's meals so successful and enjoyable. The trouble it took to prepare these items was well worth the extra effort. Unfortunately they were limited in quantity and also (because of the difficulty in dropping) were used only in the two main bases, camps 10 and 10B.

Canned Vegetables: The large gallon cans of vegetables were practical only at the main base camps and only when ten or more men were to be served. Once opened, their contents were difficult to keep and waste resulted. French's Instant Potatoes were used because of the ease and rapidity in preparation. They were a filling food and remarkably similar in appearance and taste to fresh mashed potatoes. Peas seemed to be the most popular of the vegetables; green string beans were next. Baked beans were not brought in this 1950 season, but should have been. Beef stew was another favorite item. In order to serve food to a large group which everybody would like, it was found that a good supply of stew with cans of vegetables added produced satisfactory results. Canned tomatoes were useful in this connection. Care should be taken that the juices of the vegetables are drained off before adding to the mixture, since it is easy to make the stew watery otherwise.

Sweets: Sugar was consumed in very large quantities (as on all previous expeditions). Sufficient amounts should be available at all times, not only as a flavoring but because of its importance in the diet. At the main camps, Hershey bars were not widely eaten; however on the trail they were often in short supply. Moisture ruined them if kept out-of-doors (see '48 and '49 reports) and they softened if left in doors at the main station. It was felt that cocoa supplied sufficient chocolate in the diet at Camp 10; however, later on in the season, when the Hersheys had been mostly consumed, different kinds of bars were brought and tested (such as Milky Ways, O'Henry s, Mars, Peanut chews, etc.). It is suggested that on future projects such a variety be supplied. Peanuts were also enjoyed. Other nuts were not supplied in 1950 because of their extra expense.

Pancake Flour: Pancake mix was more sparingly used in the 1950 season because of the usually attendant difficulties and time required in mixing and serving. However, it was wished many times that more plain flour and a suitable portable oven to make cake and biscuits had been available. Baking is time consuming but during stormy weather and in the main base it is a useful consideration. After the discovery that the bulk of the Army rations had been re-allocated to Korea, this demand was lessened by the plentiful supply of bakery bread.

Army Quartermaster Corps C-4 Rations: In 1949 a dozen cases of C-3 combat rations were provided by the Army. Lengthy tests have been conducted on these so that any additional comments on them at this point, other than to say they were useful as emergency trail food, would be redundant. However, during the 1950 summer season, in spite of the fact that most of the Army rations ordered were shipped instead to Korea, 42 man days of a new type C-4 ration and 125 man days of new 5-in-1, B Menu (1 to 5) rations were supplied by the Q.M.C. for emergency use and for test. There were no objections to the food contained although the lack of fruit juice powder and the rather poor inter-arrangement of breakfast, lunch and dinner items in one carton was noticeable. In some cartons, for example, there was no main item of breakfast food(e.g. no cereals, canned bacon, or other main breakfast staple). In others there would be a lack of standard and to-be-expected items to round out the lunch or supper (e.g. no meat ration at night). This was perhaps purposely done, but the members of the 1950 expedition did not particuarly approve of the apparently random selections amd missing items. However, the quality and palatability of individual canned goods were on the whole a considerable improvement over previous types of C rations, in the judgement of members of the party.

APPENDIX 1.

Supplies and Distribution, 1950

The food provided was 1400 man days of main staples (commercially purchased varieties) supplemented by 42 cases of C-4 combat ration (210 man days) and 25 cases of 5 in 1 ration (125 man days) used for emergency and outlying camp supply. These were apportioned as listed below.

A. FOOD DELIVERED TO THE TWO MAIN BASE AND RESEARCH CAMPS IN 1950

Camp 10 (Permanent Research Station)	700 man days of commercial food, 18 cases of C-4 ration, and 7 cases of 5 in 1 ration. These Army rations added 125 man days food to this camp. Approximately 100 man days of food remained unused at the end of the season and were stored for subsequent operations.
Camp 10B (Glacier Landing Strip, near center of upper Taku Glacier)	532 man days of commercial food, 13 cases of C-4 ration and 8 cases of 5 in 1 ration. These Army rations added 105 man days food to this camp. 50 man days of food were cached here at the end of the season.

B. FOOD DELIVERED TO OUTLYING CAMPS IN 1950

Camp 1 (main route)	1 emergency food unit	21 man days
Camp 4 (main route)	3 cases C-4 ration 4 cases 5 in 1 ration 1 emergency food unit	56 man days
Camp 8 (glaciology & route)	1 emergency food unit 1 case C-4 ration 1 case 5 in 1 ration	31 man days
Camp 9 (trail)	1 case C-4 ration	5 man days
Camp 11A (survey)	1 case 5 in 1 ration	5 man days
Camp 12 (survey)	1 emergency food unit	21 man days
Camp 14 (geology and route)	1 emergency food unit 1 case C-4 ration	26 man days
Camp 15 (geology and route)	1 emergency food unit 1 case C-4 ration	26 man days

Camp 16 (meteorology & route)	2 emergency food units and extra bread and trail biscuits.	82 man days
	2 cases 5 in 1 ration	
	6 cases C-4 ration	
This provides	Army ration	105 man days
	Commercial type ration	168 man days
	Total	273 man days.

APPENDIX 2

EMERGENCY FOOD UNIT - 21 Man Days 1950-51

Beverages	
Cocoa	25 pkgs. ind.
Coffee	1 lb.
Kool-ade	5 pkgs.
Orange Concentrate	2 cans, small
Tea	50 bags.
Breads	
Jersey Bread	4 lbs.
Pilot Bread	2 lbs.
Cereals	
Cream of Wheat, or Maltex	1 box med.
Oatmeal	1 box med.
Cheeses	
Processed Swiss-American	4 lbs.
Dairy Products	
Eggs (Powdered)	2 lbs.
Honey Butter	1 cnt., med.
Milk (Powdered)	2 lbs.
Oleomargarine or Canned Butter*	1 lb. can
Desserts	
Fig or Plum Pudding	3 cans
Jell-O	1 ctn.,small
Fruits, (Dried)	
Applesauce (dehydrated)	2 pkgs.
Apricots	2 lbs.
Prunes	2 lbs.
Raisins	2 pkgs., small
Fruits, (Canned)	
Peaches	1 can
Pears	1 can
Pineapple	1 can
Fruit Cocktail	1 can

* Recommended to be included on winter expeditions.

Emergency Unit (Continued)

Meats	
Bacon	3 lbs.
Beef Hash	2 cans
Beef Stew	2 cans, large
Pork	4 cans
Sardines, Norwegian	12 cans, small
Treet, Spam, or Prem	2 cans
Wieners	2 cans
Miscellaneous	
Candles, wide	2
Matches	4 small ctns.
Toilet Roll	1
Seasoning	
Salt	1 lb.
Sweets	
Peanuts, or mixed nuts	3 tins
Sugar*	5 lbs.
Hershey Bars (small, mixed)	36 bars
Life Savers	6 rolls
Vegetables (Canned)	
Carrots	2 cans
Corn	2 cans
Peas	2 cans
String Beans	2 cans
Vegetables (Dehydrated)	
French's Instant Potato Powder	2 - 8 oz. pkgs.
Soups	
Bouillon	24 cubes
Chicken Noodle	6 pkgs.
Pea	3 pkgs.
Vegetable	3 pkgs.

* 7 lbs. recommended for winter operations.

JUNEAU ICE FIELD RESEARCH PROJECT, ALASKA

Winter Expedition

January - February 1951

FOOD REPORT

Prepared by M.M. Miller and T.R. Haley, M.D.

CONTENTS

I. Requirements and Facilities

II. Dietetic Considerations and Future Recommendations

III. Comments on Food Used and Tested

Appendix 1. Food Used, Main Base, Jan.26 -Feb.26, 1951

THE JUNEAU ICE FIELD RESEARCH PROJECT

FOOD REPORT

WINTER EXPEDITION, January-February, 1951

I. Requirements and Facilities

Food supplies for the 1951 winter expedition into the Juneau Ice Field were planned for six men for a period of one month in an area of severe arctic regime. Considering the usual 10 per cent overlap given for planned food lists, this meant a basic requirement of 200 man days of food. The members of the expedition were to be flown into and out of Camps 10 and 10B by a light supporting 160 H.P. ski-aircraft and to be periodically resupplied by this plane based at the Juneau Airport. In proper weather this aircraft had a load limit of one passenger and several hundred pounds freight, but it could effect a landing on the upper Taku Glacier and return to Juneau within one hour round trip flying time. Therefore when weather permitted, the delivery of any supplies which were not flown in on the initial flights could be made shortly after being ordered by radio. Other factors which had to be taken into consideration were the lack of a full time cook which made it desirable that food could be quickly and easily prepared; the lack of storage facilities under "constant" temperature control; the existance of adequate cooking facilities but not of baking; and, lastly, a budget designed to insure high "morale" at a minimum expense. A daily menu was provided that was not unlike that ordinarily eaten in the outside world, except for the lack of fresh milk, fresh eggs, fresh fruit and vegetables. Because of the cold climate, there was slightly more emphasis on the meat(fats) constituent than for the summer expeditions. There was a sufficient variety of dehydrated and other light weight staples, and selections could be made from these to provide for an adequate diet both for the trail and for main base camps in cold weather.

The food was, as in previous years, purchased at Gus George's in Juneau at a cost of $450 for the 200 man days of food required. Fifty dollars of this expens was in the form of the previous summer's stocked supplies. This averaged $2.25 per man per day, which is only slightly less than the cost per man of food on the summer expeditions of 1948, 1949 and 1950. During the summer months the food eaten had to provide for energies more directly devoted to vigorous muscular field work, (for example a great many days spent on the trail or working in the outer areas of the ice field); however, in the winter program the work was less continuously vigorous and more routinely observational in nature. Hence the food eaten served primarily to provide body heat against the much colder temperatures encountered. As the party was only in the field a month, there were fewer "morale" items on the February project (such as fresh vegetables and fruits, etc.) This, in part, explains the slightly less overall average cost per man per day.

The calories needed for personnel working outdoors on this winter's project were estimated to approximate those necessary for an individual doing hard work, namely fifty-five to sixty-five calories per kilogram of body weight per day. The average weight of personnel was seventy-four kilograms (about one hundred and sixty-five pounds) and the average caloric needs per individual were therefore computed to be 4,070 to 4,870 calories per day, depending upon the amount of outdoor work accomplished. More calories were required by the men working and living at the glacier camp (10B) than those living at the research station (10). The temperatures at Camp 10B (directly on the surface of the Taku Glacier) were consistently twenty degrees lower than those at Camp 10 (except during periods of snow-storms or blizzards when less radiation took place and hence temperatures over the whole area were more or less equalized). The actual number of calories consumed by the party on several days of tests was calculated by Dr. Haley from dietetic tables to be approximately 4,085 calories per person.*

For reference a 21 man day emergency food unit, with notations for revisions necessary to adapt it for winter conditions is tabulated in Appendix 2, 1950 report.

II. DIETETIC CONSIDERATIONS AND FUTURE RECOMMENDATIONS

One of the most important requisites for the high 'morale' of an expedition is good food. If the expedition can be resupplied by air support, this is not a serious problem. As air support was available for the winter group to the upper Taku Glacier Camps in 1951, the men were able to enjoy most of the foods consumed at home. (See Food Inventory in the Appendix) The food was planned so that there could be variety in the meals and still fill all dietary requirements. An analysis of the food consumed shows that while the caloric intake (4,000 to 5,000 calories per day) was increased over that of the summer party, the proportions of carbohydrates, fats, and proteins remained approximately the same 40 per cent carbohydrates, 25 per cent fats, and 35 per cent proteins. As previously mentioned, this may be explained by the fact that the work done in the winter was consistently less vigorous than in the summer, and thus the additional food was needed for its greater heat-giving properties and not for additional energy as well. Under similar conditions where transportation problems do not exist, it seems reasonable to conclude that winter and summer food lists should differ more in quantity than in type of food.

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* This test was conducted on the personnel working at Camp 10. At Camp 10B, which was colder and where more outdoor work was accomplished, the daily caloric consumption was likely higher.

However, where transportation problems do exist and where conditions are such that the food is needed both for its heat and energy-giving properties, more attention must be paid to the ratio of the organic nutrients. It is then necessary to select those foods which supply the greatest amount of heat and energy for the least amount of bulk and waste. As fats provide over twice as much heat as carbohydrates or proteins,* a diet for winter work should be more rich in fat than one planned for summer. Butter or margarine, chocolate, and cheese are high in fat content and do not present a serious transportation problem. (It should be noted that a diet becomes unpalatable when more than 60 per cent of the calories are in the form of fat.)

While proteins and carbohydrates furnish equal amounts of heat per gram, carbohydrates provide 70 per cent more 'mechanical energy'. (This phenomena is known as 'specific dynamic action'.) Thus it is important that foods rich in carbohydrates be included in the diet. Such foods, which are easily transported on an expedition, are sugar, cereals, dehydrated potatoes, crackers, and cornmeal.

Protein is necessary to the body as an aid in the repair and growth of body tissues. The daily protein requirements for a man weighing about 165 pounds can be almost completely furnished by a typical expedition meal - 1 serving of powdered eggs, 2 cups of skim milk, 10 strips of bacon, and 2 ounces of American cheese. (It can be assumed that the small additional amounts necessary will be supplied in the other meals.)

Vitamins and minerals are also necessary in the diet. Minerals are supplied by dehydrated foods. Because of the short duration of the winter field party and the fairly well-rounded diet, the possibility of vitamin deficiencies was believed to be negligible. If, on a longer expedition, a dietetic analysis indicated a possible deficiency, vitamin tablets should be supplied.

III. COMMENTS ON FOOD USED

BEVERAGES: Powdered milk, in medium-sized cans, was felt to be an excellent substitute for fresh milk.. All members of the party considered it superior to any variety of condensed or semi-evaporated milk. The fact that the personnel had become accustomed to powdered milk on previous trips may account for this preference, since it is well known that one can develop a taste for powdered milk even after initially disliking it. Tea was the most popular hot beverage. (Tea is also preferred by the Eskimos and other persons living in the Arctic, in northern Alaska, or Greenland during winter months.) "Tender Leaf" and "McCormick" brands surpassed "Lipton's" tea in taste, strength, and durability of bags. As on the 1950 expedition, preference for ground coffee, however, was not as marked as usual. Instant powdered coffee, on the other hand, was well liked. Cocoa and Ovaltine were also popular hot drinks. "Kool-ade", popular with summer parties, was hardly touched; hot drinks were obviously preferred.

BISCUITS AND BREAD: Fresh sliced bread kept well and satisfied everyone's taste. Actually a variety of types of bread or biscuits was unnecessary, at least for such a short expedition. (Normally fresh bread should be considered a luxury, unless the main base had its own baking facilities.) Pancakes and ready-mixed buckwheat were very popular on the stormy days, and perhaps were more logical for use on such winter expeditions where less trail work is invloved. Syrup was preferred on the pancakes.

CEREALS: Roman Meal or Cream of Wheat were eaten almost daily for breakfast. Dry cereals were not as popular as during the summer seasons, perhaps because the winter regime created a desire for hot breakfasts. The small one-ounce packages (Kellogg's "Variety") of dry cereal were most popular whenever dry cereals were eaten.

FRUITS: It was found that the few fresh fruits which were occasionally brought in could not be kept palatable due to the lack of constant temperature storage facilities. They would "deep freeze" immediately when placed in the outside storage spaces and since it is impracticable to keep any part of the research station above freezing temperatures at night, they fared no better indoors. All canned fruits in small and medium sizes were good. Canned fruit was mainly eaten at breakfast and mixed orange and grapefruit sections were liked best.

MEAT, FISH, POULTRY, DAIRY PRODUCTS: Fresh hamburger and on one or two occasions dressed chicken friers were much enjoyed and satisfied the desire for "specialty" foods. Pork or lamb chops would have been likewise well received to increase the variety. Fresh meats could be continually kept frozen in storage by natural temperatures. All canned meats, fish and stews on hand were liked. In fact, the desire for meat (fat) foods was pronouncedly greater than in summer months. Less cheese was eaten than on the summer expeditions, perhaps because this psychologically is considered more of a trail food. Canadian bacon was especially popular and powdered eggs were considerably more acceptable to this group than to the 1950 summer expedition. They were delicious when carefully cooked and were a reasonable facsimile of fresh scrambled eggs.

PUDDINGS: All types of quick cooking puddings on the ration list and "Jell-O" went well. On a longer winter project pie mixes and fillings would be desirable items, if baking were contemplated.

SEASONING: Catsup, mustard, relish, tomato sauce, canned mushrooms, cinnamon and the usual salt and pepper were all that wasnecessary during this month. Celery and onion salt and perhaps pickles and olives would be items to consider supplying to a longer expedition since then, more than ever, an occasional extra variety or "special" touch is good for morale.

SOUPS: All types of dried soups and beef bouillon were popular. There was no particular desire for canned soups. The Lipton's 7 minute dried soups were outstanding. They were eaten almost daily, usually as a course at lunch or dinner.

SPREADS: These were not desired nearly as much as in the summer seasons. The various jams, apple butter, honey butter, peanut butter, chopped olives, and potted meat spreads tested on this winter expedition were sufficient in quantity and all were well received. A suggestion for quick and ready trail lunches might well be sandwich spread. This had previously proved to be exceedingly popular both on bread and crackers. Vinegar and mayonnaise would be desirable on a longer winter project.

SWEETS: Cube sugar is less desirable than granulated since it must be pulverized before it can conveniently be used on cereals. Log Cabin syrup and large amounts of candy, especially tinned chocolates (donated by the Brown and Haley Candy Co of Tacoma) were all readily consumed. Almond nuts were likewise enjoyed, and provided a change from the summer nut diet of peanuts. Hershey chocolate syrup and hard candies (in tins) are also recommended.

VEGETABLES: As was the case with fresh fruits, all fresh vegetables suffered damage and ruin when deeply frozen, and thus had to be eaten immediately after they had arrived on the plane. "Birds Eye" and other brands of frozen vegetables, were very enthusiastically received and neatly supplemented the diet. Frozen foods which can be eaten uncooked (e.g. berries) would be desirable for their intact vitamin content. Almost all types of canned vegetables were successfully received and used. Dried forms, with the exception of onions, potatoes, spaghetti and rice were not desired nor used on this particular mid-winter expedition.

EXPERIMENT ON BRITISH NUT PEMMICAN:

Through the courtesy of Ben Battle of the Department of Geography at Cambridge University, England, a small supply of canned Nut Pemmican* was tested for its practical use as a main course soup stock in sub-zero temperature living at winter glacier camps or on the trail. This proved to make a very satisfactory and energy giving fatigue ration for use where body heat and energy

* Which Mr. Battle says they have been developing in England for polar use. A variety of this had been manufactured under the trade title of "Nut Meat" by Mapleton's Nut Food Co., Ltd. - Garston, Liverpool 19, England.

are needed at extremely low temperatures. In more temperate climates it is perhaps sickeningly heavy and greasy; however under conditions of extreme cold it is worthy of use. This item is thought to be excellent for use on Antarctic sledge journeys, etc. One 12 ounce can supplies three man-days food according to Battle; however this is deemed to be stretching it too far, although there is no doubt that it would provide sufficient and satisfactory soup (as a main course at any one meal) for nine meals for one man or 9 men at one meal. This item is considered worthy of use as a subsidiary expeditionary supply item for arctic or polar winter work; however it is recommended that further and more extensive testing be done before it be trusted as a satisfactory major dietary unit.

APPENDIX 1

1951 W

FOOD USED, MAIN BASE,CAMP 10, JAN. 26 - FEB. 26, 1951*

Quantity	Amount	Item
		BEVERAGES
7	1 lb. cans	Powdered Milk
8	14 1/2oz. cans	Evaporated Milk
1	14 oz.	Ovaltine
3	1 oz.	Orange Kool-ade
725	single	tea bags
1	5 oz. jar	Instant Coffee
		BISCUITS & BREAD
1	5 gal. can(several hundred biscuits)	Jersey Bread
2	2lb. 8 Oz. box	Aunt Jemima Pancake
3	12 oz. boxes	Assorted cookies
		CEREALS
2	2 lb. box	Roman Meal
3	1 lb. 12 oz. box	Reg. Cream of Wheat
2	10 pkgs.	Kellogg Variety Dry Cereals
		FRUITS
2	4 oz. pkgs.	Apple Sauce Dried
9	1 lb. 14 oz. can	Half Peaches
7	1 lb. 14 oz. can	Wesco Pineapple
3	1 lb. 13 oz. can	Sliced Peaches
1	1 lb. 13 oz. can	Whole Peaches
1	1 lb. 14 oz. can	Half Pears
4	1 lb. 5 oz. can	Loganberries
2	1 lb. 4 oz. can	Raspberries
3	1 lb. 4 oz. can	Grapefruit
14	1 lb. 4 oz. can	Orange & Grapefruit Halves

* In addition, approximately two-thirds of this quantity of food was brought in on the ski-plane, and eaten at Camp 10B, which was located at 3600' Elevation and directly on the surface of the upper Taku Glacier. This represented 80 man days of rations necessary under the conditions at Camp 10B, where the temperatures averaged 20°F. colder and where considerably more outdoor work was done than at Camp 10.

Quantity	Amount	Item
		INCIDENTALS
1	pkg.	Steel Wool
4	pkg. (small)	Brillo Cleaner
9	small boxes	Diamond Matches
1	large	Ivory Soap
13	rolls	Toilet Tissue(and toweling)
1	1 lb. can	Baking Soda
1/4	125' roll	Wax Paper
1	2 lb. box.	Tide, soap powder
		MEATS
4	12oz. can	Corn Beef, Armour's
2	12 oz. can	Prem
10	12 oz. can	Spam
5	8 oz. can	Spaghetti Sauce with Meat
4	8 oz. can	White King Salmon
2	11 oz. can	Torticellis
3	5 1/2 oz.	Potted Meat Food
5	1 lb. 14 oz.	Beef Stew
9	10 oz.	Wieners
3	1 lb.	Corn Beef Cabbage
2	9 lb. slab	Bacon (also ham, hamburger, etc. listed under perishables)
		PUDDINGS
6	15 oz. can	Plum Pudding and Fig Pudding
2	small boxes	Tapioca
1	1 lb. box	Orange Jello
3	1 lb. box	Cherry Jello
3	1 lb. box	Raspberry Jello
		SEASONINGS
1	7 lb. 3 oz. can	Tomato Ketchup
2	4 oz. can	Mushrooms
1	4 oz. can	Tomato Sauce
2	4 1/2 oz.	Ripe Olives
1	1 oz. can	Franco Beef Gravy
1	1 lb. can	Cranberry Sauce
1	1 lb. 10 oz. box	Salt
1	2 lb. sack.	White Flour
		SOUPS
1	4 oz. ctn.	Split Pea Soup
23	2 oz. ctn.	Noodle Soup
22	2 oz. ctn.	Vegetable Soup
1	2 1/2 oz. ctn.	Betty Crocker Vegetable Soup
2	7/10 oz. tins	Bouillon Cubes
11	10 1/2 oz. cans	Campbell's Tomato Soups

Quantity	Amount	Item
		SPREADS
1	1 lb. jar	Cheese Spread
3	2 lb. chunk	Cheese (Swift American)
1	sm. jar	Mustard
1	12 fl. oz.	Sweet Relish
1	12 oz. jar	Apple Butter
2	14 oz. ctn.	Creamed Honey
		SWEETS
1	10 lb. bag	C-H Granular Sugar
1	3 lb. box	Cube Sugar
1	1 lb.	Thin Shells Reliance Nuts
1	1 lb.	Hickory Nuts
1	5 lb.	Log Cabin Syrup
		VEGETABLES
1	1 lb. 4 oz. can	Wesco Diced Carrots
12	8 oz. box	Instant Potatoes
2	1 lb. 3 oz.	Cut Green Beans
10	1 lb. 3 oz.	Whole Green Beans
1	7 oz.	Dhydrated Onions
5	5 oz.	Minute Rice
		PERISHABLES
9	1 lb.	Hamburger
2	2 1/2 lb.	Chickens
8	12 oz.	Mixed Vegetables
1	5 lb.	Processed Cheese
1	14 oz.	Rytack Bread
8	12 oz.	Green Peas, fresh, frozen
14	1 oz.	Oleomargraine
8	10 oz.	Green Beans, fresh, frozen
26	1 1/2 lb.	Brown Sliced Bread
26	1 1/2 lb.	White Sliced Bread
7	1 lb.	Rye Bread
1	8 Oz.	Nanti Peas, fresh, frozen
4	1 lb.	Wesco Peas, fresh frozen
1	6 lb.	Ham Wilson
2	12 lb.	Barbecue beef
1	1 lb. 9 oz.	Plum jelly
1	1 lb. 9 oz.	Grape jelly
1	1 lb. 9 oz.	Currant jelly
1	9 1/2 oz.	Panama Candy Patties
2	12 oz. bags	Assorted Candies
1	1 1/2 lb.	Green Peppers, Fresh
1	4 lb.	Lettuce, Fresh
1	3 lb. 2 oz.	Tomatoes, Fresh
1	9 lb.	Oranges, Fresh
5	1 1/2 lb. bunches	Carrots, Fresh
1	3 lb.	Turnips, Fresh
4	1 lb. 3 oz. stalks.	Celery, Fresh
4		Spaghetti Dinners

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